General

Guideline Title

Perioperative care of the pregnant woman. Evidence-based clinical practice guideline.

Bibliographic Source(s)

Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN). Perioperative care of the pregnant woman. Evidence-based clinical practice guideline. Washington (DC): Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN); 2011. 98 p. [235 references]

Guideline Status

This is the current release of the guideline.

Regulatory Alert

FDA Warning/Regulatory Alert

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- March 22, 2016 – Opioid pain medicines : The U.S. Food and Drug Administration (FDA) is warning about several safety issues with the entire class of opioid pain medicines. These safety risks are potentially harmful interactions with numerous other medications, problems with the adrenal glands, and decreased sex hormone levels. They are requiring changes to the labels of all opioid drugs to warn about these risks.

Recommendations

Major Recommendations

Note from the National Guideline Clearinghouse (NGC): Referenced rationale and quality of evidence ratings for each recommendation are provided in the original guideline document.

Patient Safety and Quality Improvement

Patient Safety

1. Ideally, a systems approach for promoting patient safety should be developed for obstetric surgical procedures. Such a system should have a collaborative team focus.
2. Implement The Joint Commission (TJC) universal protocol when caring for women having surgical births. (See Appendix A in the original guideline document.)
    a. Pre-verification process
    b. Marking the operative site (not including cesarean site)
    c. Performing a "time out" before the procedure
3. Ideally, use hospital-approved safety checklists during the preoperative, intraoperative, and postoperative periods.
4. Involve the woman and her support person(s) in the universal protocol and safety procedures, whenever applicable.
5. Promote an environment of open communication and teamwork among all members of the healthcare team.

Quality Improvement

1. Encourage multidisciplinary classroom-based team training during orientation and ongoing continuing education, whenever feasible.
2. Conduct and participate in case reviews and debriefings as indicated and according to facility guidelines.
3. Conduct and participate in simulations and emergency drills according to facility guidelines. Some subjects for simulations and emergency drills include:
    a. Emergency cesarean birth
    b. Maternal hemorrhage
    c. Failed intubation
    d. Eclampsia
    e. Shoulder dystocia
    f. Neonatal code

Nonobstetric Surgery in Pregnancy

General Consideration for Nonobstetric Surgery in Pregnancy

In making decisions about nonobstetric surgery during pregnancy, consideration should be given to the facility's capability to provide appropriate intraoperative and postoperative care to the mother and her fetus and to the level of resources available to manage both obstetric and neonatal emergencies.

1. Provide education and support to the woman and her support person(s), as appropriate, who will undergo nonobstetric surgical procedures, such as appendectomy, cholecystectomy, or gynecologic surgery.
    a. Education should include information about risks associated with nonobstetric surgery at various stages of pregnancy.
    b. Ideally, education should occur with the primary obstetric care provider.
2. Inform and communicate with the neonatal care team, as indicated. Ensure the anesthesia team is aware that the woman is pregnant.
3. In conjunction with the obstetric care provider and the surgical team, consider the necessity for administration of preoperative prophylactic glucocorticoids for women between 24 and 34 weeks of gestation.
4. Administer acid aspiration prophylaxis according to anesthesia provider orders and facility guidelines.
5. Apply sequential compression devices to the lower extremities prior to surgery according to facility guidelines. Two types of compression devices are commonly used:
    a. Graduated compression stockings
    b. Pneumatic compression devices
6. Assess for uterine contractions and fetal well-being prior to surgery.
7. Position women who are at more than 18 weeks of gestation in a left lateral tilt during the operative procedure whenever possible.
8. Ideally, the multidisciplinary obstetric and surgical team should collaborate to determine the feasibility of fetal heart rate monitoring during surgery.
9. When indicated, fetal heart monitoring should be implemented by a healthcare provider who is qualified in tracing interpretation as determined by the healthcare team. One suggested protocol may include the following:
    a. At 24 weeks of gestation or more, continuous fetal monitoring may be implemented.
    b. Prior to 24 weeks of gestation, assess fetal heart tones prior to and immediately after the procedure, at a minimum.
10. In cases in which continuous fetal monitoring is deemed necessary during abdominal surgical procedures, consider monitoring with a sterile external transducer, Doppler, or transvaginal ultrasound probe.
    - Continuous fetal monitoring with a nonsterile external transducer may be sufficient for surgical procedures that do not impact the abdomen.

11. Depending on gestational age, assess fetal heart rate and/or uterine activity in the immediate postoperative period and through recovery. One suggested protocol may include the following:
    a. Continuous uterine and fetal monitoring for fetuses at 24 or more weeks of gestation
    b. Intermittent uterine and fetal monitoring for fetuses at less than 24 weeks of gestation, and as appropriate for gestational age
    c. When possible and indicated, implement continuous uterine and fetal heart monitoring for 12–24 hours postoperatively.

Preoperative Education for Surgical Birth

1. Provide preoperative education for women undergoing a surgical birth, preferably in both written and verbal formats.
    - Include family members whenever possible.
2. Assess the woman's current knowledge and educational needs about the upcoming surgical procedure.
3. Ideally, a hospital-approved preoperative educational tool should be used to promote consistency in teaching. Topics may include but are not limited to:
    a. Preprocedural preparation
    b. Cesarean procedure
    c. Types of anesthesia
    d. Personnel in the operating room (OR)
    e. Pain management
    f. Postoperative recovery
    g. Postpartum recovery
    h. Newborn care and bonding
4. Validate the woman's understanding of educational information for clarity and consistency of the information provided.
5. Communicate identified concerns or risks with the healthcare team prior to the day of delivery, whenever possible.

Anesthesia Education

1. Provide education about various anesthesia options for surgical births according to facility guidelines.
    - Education may include the following:
        a. Neuraxial anesthesia (epidural or spinal)
        b. General anesthesia

2. Communicate identified potential risks for anesthesia in collaboration with the obstetric or anesthesia care providers.

Nothing by mouth, or NPO, Status Education

1. Explain nothing by mouth status according to anesthesia provider orders and facility guidelines.
2. Provide instruction about preoperative fluid and food restrictions. These instructions may include the following:
    a. Restrict intake of solids for at least 6–8 hours prior to surgery.
        - No high fat foods for 8 hours and no other foods for 6 hours
    b. Liquid intake should be restricted to only clear liquids between 2 and 8 hours prior to surgery. Clear liquids include but are not limited to:
        - Water
        - Non-pulp fruit juices
        - Clear tea
        - Black coffee
        - Carbonated clear beverages
        - Sports drinks

3. Provide appropriate education about the woman's current medications; identify which medications may be eliminated and which should be taken on the day of surgery.

Skin Preparation

Whenever possible, women should be encouraged to take at least one preoperative shower using an antiseptic agent approved by the U.S. Food and Drug Administration (FDA) on the night before the scheduled procedure according to facility guidelines.

Preoperative Care

Maternal Satisfaction

1. Identify and respect the values, culture, choices, and preferences of the woman who is undergoing a surgical birth and her family.
    a. A surgical birth may be planned or unplanned.
    b. Recognize that some women request a surgical birth for various cultural and emotional reasons.
2. Individualize care to meet the needs of the woman and her family. Include the family members and support persons in decisions, as applicable.
    - If requested by the mother, a doula should be allowed to provide additional support during a surgical birth, whenever possible.
3. Collaborate with the woman, her designated support person(s), and the multidisciplinary team to promote a trusting relationship with a focus on open communication.
4. Include principles of family-centered care throughout the surgical experience whenever possible.
    a. Allow the pregnant woman to identify support persons and family members who will share in her experiences.
    b. Allow one family member or support person to be present in the operative suite during the surgical procedure.
    c. Allow at least one family member or support person to be present during the postanesthesia recovery period.
    d. Keep the mother and baby together in the immediate recovery period and for the first few hours after birth.
        - Provide skin-to-skin contact whenever possible during this time.

Antibiotic Prophylaxis

1. Administer prophylactic antibiotics prior to surgery, whenever possible, and according to healthcare provider orders.
    - Administration of prophylactic antibiotics should occur within 60 minutes prior to the skin incision.
2. If it is not possible to administer antibiotics prior to the start of the surgical procedure, request an order to administer antibiotics during the procedure or immediately after the procedure.
3. Administer a narrow-spectrum antibiotic for prophylaxis whenever possible and according to healthcare provider orders.
    a. The recommended antibiotic of choice is cefazolin. For women with penicillin and cephalosporin allergy, alternative antibiotics may include clindamycin with gentamicin.
    b. Antibiotic dosing should be based on the weight of the woman.
    c. Some facilities may use azithromycin in addition to cefazolin to extend the coverage.
4. For surgical procedures lasting longer than 3–4 hours, consider repeating a dose of antibiotic according to healthcare provider orders.

Group B Streptococcus (GBS) and Newborn Prophylaxis

Collaborate with the primary healthcare provider to determine the need for intrapartum prophylaxis in the case of unplanned cesarean or planned cesarean with rupture of membranes.

Venous Thromboembolism (VTE) Prophylaxis (Pre- and Postoperative)

1. Assess for current anticoagulant usage, including time of last administered dose.
2. Administer preoperative anticoagulant therapy if indicated for women at moderate or high risk, according to healthcare provider orders.
    - Decisions regarding preoperative anticoagulation therapy should be based on the assessment of the woman's condition and unique risk factors.
3. Perform an assessment for risk of VTE. Risk factors for VTE may include but are not limited to:
    a. Cesarean delivery
    b. Emergency cesarean delivery
    c. Bedrest prior to delivery
    d. History of deep vein thrombosis (DVT)
    e. Varicose veins
    f. Maternal age more than 35 years
    g. Obesity
    h. Smoking
    i. Pregnancy complications, such as preeclampsia
    j. Comorbid medical conditions:
        - Thrombophilias
        - Diabetes
        - Heart disease or heart failure

4. After an assessment of risk factors, classify the woman according to current VTE classification guidelines:

a. Low risk: No risk factors beyond pregnancy and cesarean birth
b. Moderate risk: One additional risk factor in addition to pregnancy and surgical birth
c. High risk: More than one additional risk factor

5. Apply sequential compression devices prior to surgery according to facility guidelines. The following may be used:
    a. Graduated compression stockings
    b. Pneumatic compression devices
6. If sequential compression devices are used, leave them in place until 24 hours after the surgical birth.
7. Assist with ambulation for women at all classifications of VTE risk as soon as possible after the surgical procedure.
8. Begin administering anticoagulants 12–24 hours after the surgical birth for those women identified at moderate to high risk for DVT and according to healthcare provider orders.
9. Recognize the implications of anticoagulant therapy for women planning to breastfeed.

Aspiration Prophylaxis

1. Document the time of the woman's last solid and liquid intake.
2. Assess for conditions that may increase the risk of aspiration, such as the following:
    a. Morbid obesity
    b. Diabetes
    c. Difficult airway
    d. General anesthesia
3. Assess for adverse effects of prolonged fasting, including the following:
    a. Thirst
    b. Hunger
    c. Dizziness
    d. Nausea
    e. Vomiting
    f. Headache
    g. Dehydration
    h. Hypoglycemia
4. Administer medications to reduce maternal complications resulting from aspiration according to anesthesia orders and facility guidelines. The following agents may be used:
    a. Nonparticulate antacids such as sodium citrate and sodium bicarbonate
    b. Histamine-2-receptor antagonist, such as ranitidine or famotidine
    c. Upper gastrointestinal motility moderators, such as metoclopramide

Prewarming Measures

1. Consider administering warmed intravenous (IV) fluids and boluses whenever possible.
2. Implement hypothermia prevention measures for the pregnant woman 15 minutes prior to the administration of anesthesia and throughout surgery, whenever possible.
    a. Measures to prevent maternal hypothermia may include but are not limited to the application of cotton blankets or use of a forced air warming device.
    b. Adjust and monitor temperatures of the blanket warming cabinet according to facility guidelines.
3. Maintain OR temperature at 20–23° C (68–73° F).
4. Adjust OR temperature to facilitate normothermia in the newborn according to facility guidelines.

Intraoperative Care

Regional Anesthesia for Surgical Birth

1. The anesthesia care provider should conduct a history and physical examination prior to the administration of anesthesia.
2. Facilitate preoperative blood work according to anesthesia provider orders and facility guidelines.
3. Identify women at risk for hypotension after the initiation of regional anesthesia. Risk factors include but may not be limited to the following:
    a. Body mass index (BMI) above 29kg/m^2
    b. Age more than 35 years
    c. Sensory block height of T6 or more

4. Administer preload and/or coload according to anesthesia provider orders and facility guidelines.
    a. Ideally, when IV fluid preload is ordered, it should be administered within approximately 20–30 minutes to ensure optimal prophylactic efficacy.
    b. Ideally, when IV coload is ordered, it should be administered immediately after the initiation of regional anesthesia.
5. Obtain baseline vital signs prior to the initiation of anesthesia, including temperature, pulse, respiratory rate, blood pressure, and baseline pulse oximeter reading.
6. Monitor and document the fetal heart rate before and after the administration of regional anesthesia.
    - Monitor fetal heart tones during initiation of anesthesia as indicated and whenever possible.
7. Conduct a preprocedure verification process according to facility policy and procedure, including relevant documentation (e.g., signed procedure consent form, nursing assessment, preanesthesia assessment), diagnostic test results (e.g., blood work) and any required blood products or special equipment for the procedure.
8. Conduct a time out before the administration of anesthesia and document completion of this procedure.
    - A second time out is required prior to the surgery.
9. Assist the mother into the appropriate position during administration of regional anesthesia for the surgical birth.
10. In collaboration with the anesthesia care provider, assess for complications after regional anesthesia has been administered and throughout the surgical procedure. Side effects may include:
    a. Nausea and vomiting
    b. Pulmonary aspiration
    c. Syncope
    d. Maternal dysrhythmia
    e. Decreased uterine blood flow
11. If indicated, administer ephedrine or phenylephrine for spinal-induced hypotension according to anesthesia provider orders and facility guidelines.
12. Basic and advanced life support equipment and appropriately trained personnel should be available to assist the anesthesia care provider as indicated.

General Anesthesia for Cesarean Birth

1. Identify women who may be at risk for failed regional anesthesia. Risk factors may include but may not be limited to the following:
    a. Rapid decision-to-incision time (i.e., less than 15 minutes)
    b. American Society of Anesthesiologists (ASA) Physical Status Classification System designation of more than 4 (indicating life-threatening illness)
    c. Late placement of epidural catheter in labor
    d. Increased maternal BMI
2. If general anesthesia is indicated, assist with proper positioning for the intubation.
    - The ramped position may be indicated in the obese woman.
3. If general anesthesia is required, assist with cricoid pressure, as requested by the anesthesia care provider.
4. Recognize potential complications associated with general anesthesia for pregnant women, such as the following:
    a. Failed intubation
    b. Decreased uterine tone
    c. Poor neonatal outcomes
5. In the case of failed intubation, assist the anesthesia care provider with mask ventilation, if indicated.

Intraoperative Maternal Positioning

Maintain maternal uterine displacement using one or more of the following approaches:

a. Position the woman with a 12-cm (4.7-inch) wedge under the right lumbar region, above the iliac crest and below the lower costal region.
b. Position the woman in a left lateral position with a wedge under the right pelvis. Use a wedge, pillow, or rolled blanket to achieve a 12–15-degree tilt.

Urinary Catheters (Intraoperative and Immediate Postoperative Bladder Care)

1. Insert urinary catheter according to healthcare provider order and to facility guidelines.
2. Remove the urinary catheter in a timely manner during the postoperative period according to assessment of the woman's condition, healthcare provider orders, and facility guidelines.
3. Assess for urinary output and bladder distention at least every 4 hours after removal of the urinary catheter.

- Encourage the woman to void spontaneously, whenever possible.

4. Assess for potential inability to empty the bladder after the urinary catheter is removed.

Preoperative and Intraoperative Fetal Monitoring

1. For scheduled surgical births, document fetal status (baseline rate, presence of regular versus irregular rhythm, presence of increases or decreases in rate) prior to the scheduled procedure and according to facility guidelines. The following may be used:
    a. Fetoscope
    b. Hand-help Doppler
    c. Electronic fetal monitor
2. If electronic fetal monitoring is being used as the method of fetal surveillance for the laboring woman transitioning to a surgical birth, continue monitoring until the abdominal preparation begins.
3. If a fetal spiral electrode is being used to monitor the fetal heart rate for the laboring woman transitioning to a surgical birth, the electrode should remain in place until the abdominal preparation is completed and should be removed just prior to the start of the surgical procedure.

Skin Antisepsis

1. Assess the woman for allergies to skin preparation agents.
2. Cleanse the lower abdomen to clear the surgical site of soil, debris, and exudate if needed.
3. Do not remove hair unless it will interfere with the surgical incision.
    - If hair needs to be removed, use hair clippers immediately before moving into the operative suite.
4. Consider using preoperative skin cleansing wipes prior to OR transfer.
5. Use a Food and Drug Administration (FDA)-approved antiseptic agent for preoperative abdominal preparation according to healthcare provider orders and facility guidelines.
6. Cleanse the lower abdomen and surrounding area in the following manner:
    a. Non-scrubbed personnel should apply the antiseptic agent using sterile supplies.
    b. Wear sterile gloves unless the applicator is of sufficient length to prevent contamination from nonsterile gloves to the woman's skin.
    c. Apply the antiseptic agent beginning at the incision site and progressing outwards.
    d. Extend skin preparation to an area large enough to accommodate drape shifting, incision extension, or the potential for drains.
7. Implement measures to protect the skin and prevent injury and tissue damage from prolonged contact with skin preparation agents.
    a. Antiseptic agents should remain in place for the full drying time suggested by the manufacturer.
    b. Provide extra solution-absorbing linens on either side of the abdomen prior to skin preparation.
        - Remove excess linens as indicated if pooling of antiseptic solution is noted around the abdomen.
    c. Discuss flammable preparation agents during the time out verification process.
        - Agent applied
        - Pooling and corrective action
        - Removal of antiseptic soaked materials from the room

Newborn Equipment and Care (Delivery Room Setup and Personnel)

1. Confirm the equipment and supplies required for normal newborn care and neonatal resuscitation are readily available according to facility guidelines.
2. The preferred practice is to have at least two registered nurses (RNs) attend every surgical birth.
    a. One RN should attend to the mother in the role of circulating nurse; the other RN should attend to the baby.
    b. In the case of a multiple birth, one RN should be present for each baby.
    c. One additional staff member should be assigned to scrub.
3. At least one person skilled in neonatal resuscitation should be available whose only responsibility is to receive and care for the baby. This person should be skilled in positive pressure ventilation and chest compressions.
4. In high-risk situations, a practitioner with advanced neonatal resuscitation skills should be present or immediately available and not at home. This person should be able to perform a full resuscitation, including endotracheal intubation and prescribing and administering medications. High-risk conditions may include but are not limited to the following:
    a. Emergency cesarean
    b. General anesthesia
    c. Abnormal fetal heart rate tracing
    d. Noncephalic presentations
5. Whenever possible, the newborn should remain in the operative suite with the mother and support persons.

6. If both the mother and baby are in stable condition, facilitate skin-to-skin contact in the operative suite.

Postoperative Equipment and Staffing

1. Confirm the following equipment and supplies are at the bedside according to facility guidelines:
    a. Artificial airways
    b. Oxygen
    c. Suction
    d. Equipment to monitor blood pressure, pulse, and temperature
    e. Pulse oximeter
    f. Thermometer
    g. Blood glucose monitor
2. Ideally, two RNs should be present during the initial admission to the postanesthesia care unit (PACU).
    a. One RN should be assigned solely to the care of the mother until the critical elements for the mother have been met.
    b. One RN should be assigned solely to the care of the baby until the critical elements for the baby have been met. In the case of multiple births, one RN should be present for each baby.
    c. After the critical elements have been met and mother and baby are stable, one RN can assume care for both the mother and baby, with a second RN available to assist as necessary.
        - These staffing ratios in the postanesthesia period should continue for at least 2 hours or longer if complications are encountered.
3. Provide skin-to-skin for the mother and baby as soon as possible.
    - If the mother has chosen to breastfeed, the baby should be placed at the breast within an hour of birth.

Immediate Postanesthesia Care and Postpartum Assessment

1. Assess maternal status according to facility and professional organization guidelines. Assessments include but may not be limited to the following:
    a. Level of consciousness (orientation to time, place, person or to preoperative level)
    b. Blood pressure and pulse (every 15 minutes for 2 hours)
    c. Color (every 15 minutes)
    d. Oxygen saturation (every 15 minutes)
    e. Pain
    f. Dressing condition
    g. Intake and output
    h. Sensory and motor function
    i. Temperature (every 15 minutes until normothermic)
2. Assess fundal height, tone, and location as well as amount, character, and color of lochia frequently during the initial recovery period and according to facility guidelines.
3. Assess for bladder distention (observe for uterine displacement or other indications of bladder fullness).
    - Evaluate the tubing and catheter for patency.
4. Use a facility-approved scoring system, such as the Aldrete Scoring System or the Post Anesthetic Discharge Scoring System (PADSS), to determining the appropriate timing for discharge from phase I and transition to phase-II care.
5. Assess the newborn every 30 minutes for the first 2 hours and according to facility guidelines. Assessments include but may not limited to the following:
    a. Pulse
    b. Respiratory rate and type
    c. Skin color
    d. Level of consciousness
    e. Tone
    f. Activity

Pruritus

Assess the woman for pruritus; if present, administer antipruritic medication according to healthcare provider orders. Pharmacologic therapy may include but is not limited to the following:

a. Naloxone

b. Nalbuphine
c. Diphenhydramine
d. Ondansetron
e. Granisetron

Postoperative Pain Management

1. Assess the woman for pain with each vital sign assessment, using a standardized pain scale.
2. Use nonpharmacologic interventions in conjunction with pharmacologic agents whenever possible, such as the following:
    a. Music
    b. Positioning
    c. Presence of family members
    d. Spiritual support
    e. Distraction
    f. Quiet environment
    g. Privacy
    h. Education
3. Provide pharmacologic pain relief measures according to obstetric healthcare provider orders and maternal request. Analgesics may be administered by the following routes:
    a. By mouth
    b. Intravenously
    c. Intramuscularly
    d. Subcutaneously
    e. Intrathecally
    f. Epidural
    g. Via patient-controlled pump
4. Reassess pain at appropriate intervals following both nonpharmacologic and pharmacologic interventions.
5. Monitor for side effects related to administration of IV and intrathecal opioids.
6. If a woman is breastfeeding, ensure the analgesic medications prescribed for her are considered safe for breastfeeding women.
7. Provide support and assistance with infant care and breastfeeding to mothers receiving analgesia after having a surgical birth.

Nausea and Vomiting

1. To prevent nausea and vomiting, transfer the woman from the OR table using gentle, smooth movements.
2. Assess for nausea on admission to the recovery area, on discharge, and more often as indicated.
    - If nausea is present, assess blood pressure and level of hydration.
3. To alleviate or minimize nausea and vomiting, administer prescribed medication, including but not limited to the following:
    a. Ondansetron
    b. Granisetron
    c. Metoclopramide
    d. Promethazine
    e. Scopolamine

Postoperative Nutrition

1. Provide women oral nutrition following surgical birth according to facility guidelines and as tolerated.
    a. Offer oral hydration within 2 hours, as indicated.
    b. Offer small meals within 8 hours, as indicated.
2. Assess woman for potential postoperative complications relevant to the decision to offer oral nutrition, including but not limited to the following:
    a. Abdominal distention
    b. Bloating and gassiness
    c. Diffuse, persistent abdominal pain
    d. Nausea and/or vomiting
    e. Inability to pass flatus
    f. Inability to tolerate an oral diet

Considerations for Unscheduled Surgical Birth

Psychosocial Considerations

1. Identify maternal factors that may lead to decreased overall satisfaction with the birth experience, such as the following:
    a. Poor communication by the healthcare team with the woman and her family
    b. Fear and other emotions
    c. Missing the birth and immediate postpartum period
    d. Anesthesia
2. Provide support and education to women who are having an unscheduled surgical birth.
    a. Help ensure the woman and her support person(s) receive information appropriate to the circumstances.
    b. Provide emotional support during the transitional process from labor to preparation for surgery.
    c. Facilitate communication with the entire healthcare team.
    d. Facilitate the presence of the patient's support person during the preoperative preparation and the surgical procedure, whenever possible.
3. In the postpartum period, assess the need for targeted home follow-up for women undergoing unplanned surgical births.

Transition from Vaginal to Surgical Birth

1. Once the decision for surgical birth is made, prioritize the care needed to facilitate delivery. The following are indicated:
    a. Obtain informed consent
    b. Assemble the surgical and neonatal teams
    c. Ensure IV access
    d. Review maternal laboratory results and the potential need for transfusion
    e. Insert a urinary catheter
2. Recognize the potential for maternal and neonatal complications during the surgical procedure for women who have reached the second stage of labor. These include but are not limited to the following:
    a. Impaction of fetal head
    b. Excessive maternal blood loss
    c. Fetal hypoxia
3. For women in the second stage of labor, perform fetal assessments every 5 minutes and according to high risk standards until the abdominal prep is completed.
4. Identify risk factors that may make conversion of labor epidural to epidural anesthesia for a surgical birth more difficult. These include the following:
    a. Young maternal age, high body mass index (BMI) at time of delivery, and greater gestational age
    b. Need for more topoffs during labor
5. Regardless of the indication for surgical birth, implement the universal protocol prior to incision.
    a. Pre-verification process
    b. Time out before the procedure

Considerations for Decision-to-Incision

Facilitate the transition to the unscheduled surgical birth in a timely manner and in collaboration with the obstetric care team.

- Maternal conditions that may require time for stabilization may include the following:
    a. Hemorrhage
    b. Obesity
    c. Cardiopulmonary compromise

Considerations for Multiple Births

1. Help identify risks associated with the need for surgical birth of a second or higher-order fetus. These may include but are not limited to the following:
    a. Maternal age
    b. Parity
    c. Chorionicity
    d. Gestational age of 39 weeks or more

    e. Malpresentation
    f. Fetal growth
    g. Pregnancy-induced hypertension
    h. Premature rupture of the membranes
    i. Operative vaginal delivery of the first twin
2. Help ensure that all appropriate resources, including appropriate OR support and personnel, are available for multiple births.
3. Prepare for potential maternal and neonatal complications associated with surgical birth after vaginal birth of the first newborn.

Considerations for the Obese Patient

1. Provide nonjudgmental care for the obese patient undergoing surgical birth.
2. Ideally, obese pregnant women should have a targeted anesthesia consultation before admission for labor.
3. During labor, monitor obese women for dysfunctional labor patterns that may necessitate a surgical birth.
4. Use a multidisciplinary team approach when preparing an obese pregnant woman for a surgical birth. Gather and utilize appropriate equipment.
    a. Determine weight limits of birthing beds, OR tables, carts, and toilets.
    b. Use a large-size blood pressure cuff.
    c. Consider using motorized carts and wheelchairs, when available.
5. Anticipate potential anesthesia difficulties in obese women requiring a surgical birth, such as the following:
    a. Failed regional block
    b. Difficult intubation
    c. Aspiration
    d. Difficult IV access
    e. Inadequate pain control
6. Assist the anesthesia team with positioning for intubation if indicated.
    - The ramped position may be indicated for the obese woman.
7. Have equipment readily available for a potential vacuum-assisted surgical delivery.
8. Assess for potential postpartum complications, including the following:
    a. Difficult fundal assessment
    b. Surgical site infections
    c. DVT
9. Support breastfeeding efforts and facilitate lactation consultation in the early postpartum period, whenever possible.

Postoperative Complications

Recognizing Deteriorating Conditions in the Postpartum Period

1. Complete vital signs and assessments for women having a surgical birth according to facility guidelines:
    a. Blood pressure and pulse should be monitored at least every 15 minutes for the first 2 hours after delivery.
    b. A suggested frequency for ongoing blood pressure, pulse, and respiration assessment is every 4 hours until stable and then every 8 hours until discharge.
    c. Assess maternal temperature every 4 hours for 8 hours after delivery and then every 8 hours until discharge.
2. Assess for signs of complications and deteriorating maternal conditions and communicate findings with the healthcare team.

Postoperative Complications

Pulmonary Embolus

1. Identify risk factors that predispose the woman to potential postoperative pulmonary embolism, including the following:
    a. Advanced maternal age
    b. Increased parity
    c. Smoking
    d. Preeclampsia
    e. Multiple gestation
    f. Diabetes
    g. Cesarean delivery
2. Assess women in the immediate postoperative period for signs and symptoms of pulmonary embolus. These may include but may not be

limited to the following:

a. Dyspnea
b. Tachypnea
c. Cyanosis
d. Air hunger
e. Anxiety
f. Chest pain
g. Tachycardia
h. Cough
i. Changes in heart and lung sounds
j. Chest tightness, shortness of breath
k. Hypotension

3. Ideally, a multidisciplinary team approach should be utilized to provide care to the woman with a pulmonary embolus. The following interventions may be indicated:
    a. Arterial blood gas sampling
    b. Ventilation-perfusion scan
    c. Angiography
    d. Chest x-ray or computed tomography (CT) scan
    e. Electrocardiogram
4. Administer anticoagulation therapy according to healthcare provider orders and facility guidelines.
5. Assess the woman receiving anticoagulation therapy for bleeding and other complications, such as thrombocytopenia, with routine assessments and as indicated.
6. Educate the woman about signs and symptoms of bleeding and about anticoagulant therapy.

Postpartum Hemorrhage

1. Identify risk factors that predispose the woman having surgical birth to postpartum hemorrhage. Risk factors may include the following:
    a. Preterm birth
    b. General anesthesia
    c. Maternal blood disorders
    d. Induction of labor
    e. Prior surgical birth
    f. Vaginal birth after cesarean (VBAC) that evolves to emergency surgery
    g. Trauma-related bleeding
    h. Structural abnormalities (placenta previa, presence of fibroids, uterine septum, retained placenta)
    i. Uterine overdistention (multiple gestation, polyhydramnios)
2. Periodically assess for excessive uterine bleeding and uterine atony. A suggested frequency is every 8 hours after the initial recovery period. More frequent assessments may be needed depending on the individual woman's condition.
    a. Assess the uterus when the bladder is empty.
    b. Assist with bimanual examination as indicated.
3. Administer uterotonic medications as indicated and according to care provider orders. The following uterotonics are commonly used:
    a. Oxytocin
        - A typical dosing regimen is 10–40 IU of oxytocin in 1,000 mL of normal saline or lactated Ringer's solution infused at a rate adjusted to uterine response.
    b. Misoprostol
    c. Methylergonovine
    d. Carboprost
    e. Carbetocin (Canada only)

4. Ideally, a multidisciplinary team approach should be used in providing care to the woman with a postpartum hemorrhage. The following interventions may be indicated:
    a. Administer oxygen, initiate large-bore IV access, initiate volume replacement therapy, consider inserting a second IV line or a central line, and assess maternal vital signs frequently.
    b. Monitor laboratory values, including complete blood count, hemoglobin and hematocrit, type and screen, and clotting studies and prepare for transfusion therapy.

Surgical Site Infections and Endometritis

1. Assist in identifying women who may be at risk for postpartum infection in the postpartum surgical period.
    a. Risk factors include the following:
        - Obesity and diabetes
        - Chronic hypertension
        - Prolonged labor or ruptured membranes
        - Labor before surgical birth
    b. Risk factors for endometritis include the following:
        - Cesarean delivery
        - Prolonged rupture of membranes
        - Prolonged labor
        - Intrapartum fever
        - Lower socioeconomic status

2. Maintain postoperative dressing as indicated according to facility guidelines.
    - Remove drains as soon as discharge ceases — the day after surgery, if possible.
3. Assess for signs and symptoms of a surgical site wound infection and endometritis with routine postpartum assessments.
    a. Signs of a surgical site wound infection may include the following:
        - Serous and/or purulent drainage
        - Erythema
        - Positive culture from the wound
        - Fever
        - Pain
        - Wound dehiscence
        - Presence of an abscess
    b. Signs of endometritis include:
        - Fever
        - Chills
        - Uterine tenderness
        - Foul-smelling lochia
        - Purulent appearance of endometrial tissue

4. Assist with wound cultures if indicated and as ordered.
5. Implement wound care measures as indicated and according to healthcare provider orders for women with identified wound infections. These may include but are not limited to the following:
    a. Irrigation
    b. Application of:
        - Wet-to-dry dressings
        - Transparent films
        - Hydrogel dressings

6. Administer broad-spectrum antimicrobial agents and supportive therapy according to healthcare provider orders.
7. Educate the woman about signs and symptoms of late wound infection prior to discharge. These include but are not limited to the following:
    a. Fever and/or chills
    b. Malaise
    c. Lower abdomen tenderness
    d. Foul-smelling vaginal discharge
    e. Decrease in appetite

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Conditions requiring surgical procedures during pregnancy

Guideline Category

Evaluation

Management

Treatment

Clinical Specialty

Anesthesiology

Family Practice

Nursing

Obstetrics and Gynecology

Surgery

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Health Care Providers

Hospitals

Nurses

Guideline Objective(s)

- To provide perinatal registered nurses (RNs) and advanced practice registered nurses (APRNs) with clinical practice recommendations for the care of pregnant women undergoing surgical procedures based on the best available evidence.
- To provide care to women who have surgical births and other surgical procedures that is comparable to those patients having surgical procedures in the general operating room (OR) based on scientific principles and empiric evidence.
- To describe evidence-based approaches to accomplish the following:
    - Describe patient safety measures when caring for pregnant women needing surgical care
    - Prepare the pregnant woman and her support person(s) for surgical procedures
    - Provide appropriate preoperative family-centered education
    - Identify interventions that promote family-centered care practices
    - Initiate assessments and interventions appropriate for women undergoing nonobstetric surgical procedures
    - Assess and intervene appropriately during the preoperative, intraoperative, and postoperative periods for women undergoing surgical birth
    - Assess and manage commonly identified complications related to surgical birth

Target Population

Pregnant women who require surgical procedures during their pregnancy and pregnant women having surgical births, including women in the preoperative, intraoperative, and postoperative phases, as well as to immediate care of the newborn

Interventions and Practices Considered

1. Patient safety: The Joint Commission's (TJC's) universal protocol and use hospital-approved checklists
2. Nonobstetric surgery during pregnancy
    - Education and support of patient and her support person(s)
    - Acid aspiration prophylaxis
    - Compression devices
    - Positioning of patient
    - Monitoring of fetal heart rate and/or uterine activity
3. Preoperative education for surgical birth
    - Anesthesia options
    - Nothing by mouth, NPO, status education
    - Skin preparation
4. Preoperative care
    - Family centered care
    - Antibiotic prophylaxis
    - Group B Streptococcus (GBS) and newborn prophylaxis
    - Venous thromboembolism (VTE) prophylaxis (preoperative anticoagulant therapy, sequential compression devices)
    - Aspiration prophylaxis
    - Prewarming measures for intravenous fluids and operating room (OR) temperature
5. Intraoperative care
    - Regional anesthesia for surgical birth
    - General anesthesia for Cesarean birth
    - Maternal positioning with lumbar wedge
    - Urinary catheter assessment
    - Fetal monitoring
    - Skin antisepsis
    - Newborn equipment and care
6. Postoperative care
    - Confirmation of equipment and appropriate staffing
    - Skin-to-skin contact for mother and baby
    - Newborn assessment and patient scoring tool to determine readiness for discharge
    - Patient assessment for pruritus, pain management, nausea and vomiting, nutrition
7. Special considerations for unscheduled surgical birth
    - Psychosocial needs
    - Transition from vaginal to surgical birth/decision-to-incision
    - Multiple births
8. Considerations for the obese patient
9. Assessment for deteriorating conditions (pulmonary embolus, postpartum hemorrhage, surgical site infections and endometritis)

Major Outcomes Considered

- Patient satisfaction
- Quality of care
- Patient safety/outcomes (morbidity/mortality)

Methodology

Methods Used to Collect/Select the Evidence

Hand-searches of Published Literature (Primary Sources)

Hand-searches of Published Literature (Secondary Sources)

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

The original search, conducted using PubMed, MEDLINE, and the Cumulative Index of Nursing and Allied Health Literature (CINAHL) databases, was limited to articles in English published between 2005 and 2010. Articles were also selected from the Cochrane Library. Articles reporting the results of a variety of clinical trials, review articles, and reports of case studies were reviewed and scored. Duplicate citations were identified and eliminated. Additional articles, including selected articles before 2005 and articles published in 2010 after completion of the original literature search, were retrieved and scored based on knowledge of critical works. As new topics or gaps in the literature were identified, additional articles were retrieved and searches expanded to include publications before 2005.

The original literature search strategy included identification of citations in which the terms cesarean, cesarean section, cesarean birth, or cesarean delivery appeared in combination with any of the following terms:

- Family-centered care
- Maternal satisfaction
- Antibiotic prophylaxis
- Aspiration prophylaxis
- Deep vein thrombosis (DVT) prophylaxis
- Prewarming and room temperature
- Anesthesia
- Positioning
- Postoperative care
- Skin-to-skin contact and immediate breastfeeding
- Pain management
- Transition from vaginal to cesarean delivery
- Obesity and other complications

Additional literature reviewed included guidelines and position statements from the following professional organizations: American Society of Anesthesiologists (ASA), American College of Obstetricians and Gynecologists (ACOG), American Society of PeriAnesthesia Nurses (ASPAN), Association of periOperative Registered Nurses (AORN), and the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN). Guidelines for perinatal care, published by the American Academy of Pediatrics (AAP) and ACOG, and guidelines published through Canadian organizations were also included in the initial review.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Quality of Evidence

I: Evidence obtained from at least one properly designed randomized controlled trial or metaanalysis of randomized controlled trials.

II-1: Evidence obtained from well-designed controlled trials without randomization.

II-2: Evidence obtained from well-designed cohort or case-control analytic studies, preferably from more than one center or research group.

II-3: Evidence from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments (such as the results of the introduction of penicillin treatment in the 1940s) could also be regarded as this type of evidence.

III: Opinions of respected authorities, based on clinical experience, descriptive studies, or reports of expert committees.

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Literature Evaluation and Scoring

A system and tool for scoring the literature was developed based on the method for literature analysis presented in the American Nurses Association (ANA) *Manual to Develop Guidelines**. Using this framework, each qualitative study reviewed by the Guideline Development Team was evaluated using the following eight criteria:

- Problem or question studied: Clearly stated, significant and relevant problem
- Sampling: Representative sampling, less than 20% dropout rate, and random selection process
- Measurement: Tools/methods appropriate, reliable, and valid
- Internal validity: Accurate conclusions about covariation
- External validity: Valid conclusions about generalizability
- Construct validity: Appropriate independent and dependent variables identified
- Statistical conclusion validity: Statistical significance supported by data ($p \leq 0.05$)
- Justification for conclusions: Causal conclusions justified

A description of the above criteria and a sample scoring tool can be found in the ANA *Manual**.

*Marek, K. (1995). *Manual to develop guidelines*. ANA Committee on Nursing Practice Standards & Guidelines. Washington, DC: American Nurses Publishing, American Nurses Foundation/American Nurses Association.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

The Perioperative Care of the Pregnant Woman Evidence-Based Clinical Practice Guideline and Quick Care Guide were developed by the Evidence-Based Clinical Practice Guideline Development Team, which is comprised of member experts of the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN). The team members were selected for guideline development by AWHONN for their expertise as scientists and clinicians dedicated to improving the health and well-being of women and newborns.

The process for guideline development described herein was the result of the combined efforts of AWHONN's Practice, Research, and Education committees undertaken in 1998 using the framework presented in the American Nurses Association (ANA) *Manual to Develop Guidelines**.

Team members participated throughout 2010 in teleconferences, literature review, evaluation and scoring of research articles, and creation of the Evidence-Based Clinical Practice Guideline. Consensus was used to delimit the multidisciplinary literature reviewed and accepted for use in this Guideline.

*Marek, K. (1995). *Manual to develop guidelines*. ANA Committee on Nursing Practice Standards & Guidelines. Washington, DC: American Nurses Publishing, American Nurses Foundation/American Nurses Association.

Rating Scheme for the Strength of the Recommendations

Not applicable

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Not stated

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the original guideline document for referenced rationale and specific quality of evidence ratings for each recommendation).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate and safe perioperative care of the pregnant woman

Potential Harms

- Assess the woman receiving anticoagulation therapy for bleeding and other complications, such as thrombocytopenia, with routine assessments and as indicated.
- Low-dose aspirin should be used with caution during breastfeeding.
- Women who take a nonparticulate antacid may have an increased incidence of nausea requiring additional medications.
- Slightly lower umbilical cord pH values have been found in neonates after administration of ephedrine.
- When using the ramped position, care should be taken to minimize maternal brachial plexus injury by avoiding arm abduction beyond 90 degrees.
- Certain skin preparation solutions may be the fuel source in the event of an operating room (OR) fire.
- Analgesics may have side effects including nausea and vomiting, confusion, sedation, and pruritus.
- Side effects of opioids, such as morphine, may include pruritus, nausea, vomiting, urinary retention, and respiratory depression.
- Ketorolac carries a "black-box" (i.e., Food and Drug Administration [FDA]-mandated) warning against its use in breastfeeding mothers.
- Postpartum women who are taking warfarin postoperatively should receive education about the drug and the effects on future pregnancies, which may include nasal hypoplasia, ophthalmologic abnormalities, and mental retardation.
- Higher doses of oxytocin in the postpartum period may lead to maternal hypotension.
- Bronchospasm is a potentially life-threatening adverse reaction that may occur in patients with a history of asthma when taking carboprost.

Qualifying Statements

Qualifying Statements

- The Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's (ANCC's) Commission on Accreditation. Accredited status does not imply endorsement by AWHONN or ANCC of any commercial products displayed or discussed in conjunction with this activity.
- AWHONN requires authors and planners to identify investigational products or off-label uses of products regulated by the U.S. Food and Drug Administration at first mention and whenever appropriate in the content. It is the intent that no off-label drugs or devices are presented in this Guideline.
- This Evidence-Based Clinical Practice Guideline was developed for AWHONN, as an informational resource for nursing practice. The Guideline does not define a standard of care, nor is it intended to dictate an exclusive course of management. It presents general methods and techniques of practice that AWHONN believes to be currently and widely viewed as acceptable, based on current research and recognized authorities.
- Proper care of individual patients may depend on many individual factors to be considered in clinical practice, as well as professional judgment in the techniques described herein. Variations and innovations that are consistent with law and that demonstrably improve the quality of patient care should be encouraged. AWHONN believes the drug classifications and selections set forth in this text are in accordance with current recommendations and practice at the time of publication. However, in view of ongoing research, changes in government regulations, and the constant flow of information relating to drug therapy and drug reactions, the reader is urged to check information available in other published sources for each drug for potential changes in indications, dosages, warnings, and precautions. This is particularly important when a recommended agent is a new or infrequently employed drug. In addition, appropriate medication use may depend on unique factors such as individuals' health status, other medication use, and other factors that the professional must consider in clinical practice.
- The information presented here is not designed to define standards of practice for employment, licensure, discipline, legal, or other purposes.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Chart Documentation/Checklists/Forms

Quick Reference Guides/Physician Guides

Staff Training/Competency Material

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Safety

Identifying Information and Availability

Bibliographic Source(s)

Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN). Perioperative care of the pregnant woman. Evidence-based clinical practice guideline. Washington (DC): Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN); 2011. 98 p. [235 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2011

Guideline Developer(s)

Association of Women's Health, Obstetric, and Neonatal Nurses - Professional Association

Source(s) of Funding

Association of Women's Health, Obstetric and Neonatal Nurses

Guideline Committee

2011 Perioperative Care of the Pregnant Women Guideline Development Team

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Financial Disclosures/Conflicts of Interest

The Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) requires authors, planners, and reviewers in a position to control content of an Evidence-Based Clinical Practice Guideline to disclose all relevant financial relationships with any commercial interest. The authors and nurse planners for this Evidence-Based Clinical Practice Guideline disclosed no relevant financial relationships that might create a

conflict of interest. The nurse planners have taken measures to mitigate the risk of commercial bias by participating in development and review of the Evidence-Based Clinical Practice Guideline and by developing its associated continuing education activity.

Guideline Status

This is the current release of the guideline.

Guideline Availability

Electronic copies: Not available at this time.

Print copies: Available by contacting the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN), 2000 L Street, N.W. Suite 740, Washington, D.C. 20036; Phone: (800) 354-2268; Web site: www.awhonn.org/store .

Availability of Companion Documents

The following is available:

- Perioperative care of the pregnant woman. Quick care guide. Washington (DC): Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN); 2011. 2 p.

Electronic copies: Not available at this time.

Print copies: Available by contacting the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN), 2000 L Street, N.W. Suite 740, Washington, D.C. 20036; Phone: (800) 354-2268; Web site: www.awhonn.org .

Also, the appendices of the original guideline document contain The Joint Commission's Universal Protocol for Preventing Wrong Site, Wrong Procedure, and Wrong Person Surgery; the World Health Organization's Surgical Safety Checklist; a continuing nursing education credit application; a participant feedback tool; and post-test questions.

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on June 8, 2012. The information was verified by the guideline developer on July 19, 2012. This summary was updated by ECRI Institute on September 10, 2012 following the U.S. Food and Drug Administration advisory on Ondansetron (Zofran). This summary was updated by ECRI Institute on December 12, 2012 following the U.S. Food and Drug Administration advisory on Ondansetron (Zofran). This summary was updated by ECRI Institute on September 18, 2015 following the U.S. Food and Drug Administration advisory on non-aspirin nonsteroidal anti-inflammatory drugs (NSAIDs). This summary was updated by ECRI Institute on June 2, 2016 following the U.S. Food and Drug Administration advisory on Opioid pain medicines.

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